Remarks/Arguments:

Claims 1-3 are pending. Claims 4-27 have been canceled in the present application. Claim 28 has been added. Support for newly added claim 28 is in the specification at paragraph [0045]. No new subject matter has been added.

Claims 1-3 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Ehrmann et al. (US Patent Application Publication No. 2002/0170898 A1) in view of either Nishisaka (JP 357097886A) or Dunsky et al. (US 6,433,301). Applicants respectfully submit that claims 1-3 are not subject to these rejections for the reason set forth below.

As stated in the Office Action (page 3, second paragraph), Ehrmann et al. disclose the use of "modified elliptical spots" (i.e. spots having a non-circular beam intensity profile) to improve processing speed. Paragraph [0104]. Ehrmann et al. disclose several approaches to forming these modified elliptical spots. For example, paragraph [0144] discloses, with reference to Fig. 22, separating a beam onto two optical paths 122 and 123. A polarizing beam splitter is used to separate the beam. The intensity aspect ratio (and orientation of the elliptical intensity profile) of the portion of the beam in each optical path is changed differently. The two portions are then recombined so that the intensity profile of beam is polarization dependent. Polarization rotator 127 may used to select the polarization, and thus intensity profile, of output beam 128. Ehrmann et al. also disclose in paragraph [0144] that "element(s) 127 may be a waveplate used to convert to a circular polarization or optical elements to create an unpolarized delivery beam." However, Ehrmann et al. do not disclose the use of the polarization of the laser beam to directly control the shape of the area of the surface machined by the beam.

Nishisaka discloses controlling the power supply of an array of semiconductor laser elements 2, as shown in Fig. 1, 2, and 3, to generate output laser beams having specific intensity profiles, as shown in Fig. 4. See Abstract.

Dunsky et al. disclose means for the intensity profile of laser beams as shown in Figs. 5A-5C and 6A-6D.

Ehrmann et al., Nishisaka, and Dunsky et al. do not disclose or suggest, singly or in combination, a feature recited in claim 1 of the present application, namely:

> ...b) focusing the pulse of laser light to the beam spot within a target area of the microstructure workpiece such that the pulse of laser light has a substantially circularly symmetric beam intensity profile at the beam spot;...

> ...d) adjusting an ellipticity of the polarization of the pulse of laser light such that the pulse of laser light has contours of constant machining capacity on the surface of the microstructure workpiece, the constant machining capacity contours having a substantially similar shape to the predetermined elliptical shape; and
>
> e) controlling fluence of the focused pulse of laser light in the beam spot such that the area of the surface of the workpiece laser machined by the pulse of laser light is substantially the predetermined elliptical shape. (Emphasis added.)

This feature of the present invention is described in the specification at paragraph [0045]. No new subject matter has been added.

The present invention, as recited in claim 1, controls both the polarization properties and the fluence of pulses of laser light so that each pulse of laser light machines an area of the workpiece surface that substantially matches a predetermined shape, without varying the intensity profile of the beam spot.

Ehrmann et al. disclose using modified elliptical beam spots to control the shape of the area of the workpiece surface being machined. Abstract, paragraphs [0046], [0053], [0104], [0139], and claims 13 and 20, etc. Ehrmann et al. do not disclose or suggest controlling the shape of the area of the workpiece surface being machined other than by varying the intensity profile of the beam spot. Although Ehrmann et al. disclose the use of beam polarization in methods for producing beams that elliptical beam intensity profiles and elliptical beam spots, Ehrmann et al. do not disclose or suggest that a "predetermined elliptical shape" can be machined on a workpiece surface using a "pulse of laser light has a substantially circularly symmetric beam intensity profile at the beam spot," as recited in claim 1 of the present application.

Nishisaka and Dunsky et al. do not disclose the use of polarization in laser machining and, thus cannot overcome the deficiencies of Ehrmann et al. with regard to claim 1 of the present application.

Therefore, for the reasons described above, claim 1 is not be subject to rejection under 35 U.S.C. § 103(a) as unpatentable over Ehrmann et al. in view of Nishisaka, nor is claim 1 subject to rejection under 35 U.S.C. § 103(a) as unpatentable over Ehrmann et al. in view of Dunsky et al. As claims 2 and 3 depend from claim 1, these claims are not subject to these rejections as well.

Newly added claim 28 depends from claim 1. Consideration and allowance of claim 28 is respectfully requested.

Conclusion

In view of the foregoing amendments and remarks, Applicants request that the Examiner reconsider and withdraw the rejection of claims 1-3, as well as consideration of newly added claim 28.

Respectfully submitted,

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